Risk scales:
Fear the diseases, not the vaccines

This document is intended to support immunization programme managers and staff in their efforts to secure sustainable funding for immunization.

HOW TO USE THIS DOCUMENT
Some stakeholders may believe that vaccines are not safe and may fear the possible side-effects of vaccines. The key message here is that **you need to fear the diseases, not the vaccines**. The illustrations in this document can be used to support this message.

The risk of side-effects following vaccination needs to be compared with the risk associated with the disease. However, the risk of side-effects of the treatment used to alleviate the symptoms of the disease should also be taken into account.

This document illustrates both of these types of risk comparisons for three types of vaccines that are used to prevent highly infectious diseases: measles vaccine, pneumococcal conjugate vaccine and Hib vaccine.

Use the document to prepare for meetings or as a hand-out to partners or decision-makers.
## Measles

### Possible complications of measles

<table>
<thead>
<tr>
<th>Disease</th>
<th>Side Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>OTITIS (EAR INFECTION)</td>
<td>• 7-9% of infected people.</td>
</tr>
<tr>
<td>DIARRHEA</td>
<td>• 6% of infected people.</td>
</tr>
<tr>
<td>CHRONIC AND PROGRESSIVE BRAIN INFLAMMATION (SSPE)</td>
<td>• 1 out of every 100,000 infected people.</td>
</tr>
<tr>
<td>PNEUMONIA</td>
<td>• 1-6% of infected people.</td>
</tr>
<tr>
<td>INFECTION THAT CAUSES BRAIN SWELLING (ENCEPHALOMYELITIS)</td>
<td>1 out of every 2,000 infected people.</td>
</tr>
<tr>
<td>DEATH</td>
<td>• 0.1-1 out of every 1,000 infected people.</td>
</tr>
</tbody>
</table>

### Possible complications of the disease and possible side effects of its treatment

#### Measles vaccine

<table>
<thead>
<tr>
<th>Side Effect</th>
</tr>
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<tbody>
<tr>
<td>COMMON</td>
</tr>
<tr>
<td>• Mild, local reactions, such as redness and pain at the injection site, occur in more than 10% of vaccinations.</td>
</tr>
<tr>
<td>• Fever occurs in 5-10% of vaccinations.</td>
</tr>
<tr>
<td>• Rash occurs in 5% of vaccinations.</td>
</tr>
<tr>
<td>RARE</td>
</tr>
<tr>
<td>• Fever with convulsions occur in less than 0.1% of vaccinations.</td>
</tr>
<tr>
<td>• Inflammation of brain and spinal cord (encephalomyelitis) occurs in 1 out of 1 million vaccinations.</td>
</tr>
<tr>
<td>• Low blood platelet count (thrombocytopenia) occurs in 1 out of 30,000-40,000 vaccinations.</td>
</tr>
<tr>
<td>• Serious allergic reaction (anaphylaxis) occurs in 3.5 out of 10 million vaccinations.</td>
</tr>
</tbody>
</table>

#### Paracetamol

<table>
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<th>Side Effect</th>
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<tr>
<td>COMMON</td>
</tr>
<tr>
<td>• Irritation and inflammation inside the nose (rhinitis).</td>
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<tr>
<td>• Severe shortness of breath (dyspnea).</td>
</tr>
<tr>
<td>• Coughing, heaviness and tightness in the chest or wheezing (paroxysmal bronchial spasm).</td>
</tr>
<tr>
<td>• Bleeding from the gastrointestinal digestive tract (gastrointestinal haemorrhage).</td>
</tr>
<tr>
<td>• Indigestion or upset stomach (dyspepsia).</td>
</tr>
<tr>
<td>• Abdominal pain.</td>
</tr>
<tr>
<td>• Ulcer.</td>
</tr>
<tr>
<td>• Other.</td>
</tr>
</tbody>
</table>

#### Treatment

Most common unwanted side-effects of paracetamol (often used to treat fever in measles patients)

<table>
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<tr>
<th>Side Effect</th>
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<tr>
<td>COMMON</td>
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<tr>
<td>• Liver and kidney damage may occur in case of an overdose.</td>
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<tr>
<td>• Serious complications may occur in combination with other drugs.</td>
</tr>
</tbody>
</table>

### Possible complications of Haemophilus influenzae type B (Hib) infection

#### Inflammation of Joints (Septic Arthritis)
- Can lead to:
  - Meningitis occurs in 10-30% of cases.
  - Bacterial skin infection (cellulitis) in 10-30% of cases.
  - Bone infection (osteomyelitis) in 5-10% of cases.
  - Pneumonia in 5% of cases.

#### Meningitis Occurs in 50-65% of All Invasive Hib Cases
- Can lead to:
  - Death in 2-5% of cases.
  - Long-term effects such as hearing loss or other chronic neurologic conditions, in 15-30% of those who survive.

#### Pneumonia
- Can lead to:
  - Aggression.
  - Anxiety.
  - Irregular heartbeat.
  - Swelling of fingers, hands, feet and legs.
  - Troubled breathing when resting.
  - Headache.
  - Dizziness.
  - Blurred vision.
  - Other.

#### Inflammation at the Back of the Tongue (Epiglottitis)
- Occurs in 14.7 out of every 100 000 infected children (0-4 yrs).
- Can lead to:
  - Death.
  - Respiratory failure.
  - Pneumonia.
  - Meningitis.
  - Sepsis.

#### Bacterial Skin Infection (Cellulitis)
- Progresses rapidly.
- Involves face, head or neck.
- Requires antibiotic treatment.

### Possible unwanted side-effects of mono-Hib conjugated vaccine

#### Very Common
- Mild soreness at the injection site occurs in more than 10% of vaccinations.

#### Common
- Fever occurs in 2% of vaccinations.

#### Possible complications of the disease and possible side effects of its treatment

### Possible unwanted side-effects of anti-inflammatory therapy with dexamethasone
- (commonly used to treat Hib and prevent hearing loss)

#### Common (occurs in more than 1%):
- Aggression.
- Anxiety.
- Irregular heartbeat.
- Swelling of fingers, hands, feet and legs.
- Troubled breathing when resting.
- Headache.
- Dizziness.
- Blurred vision.
- Other.

#### Rare (occurs in less than 1%):
- Cardiac arrest.
- Enlarged liver (reversible hepatomegaly).
- Blood clot inside deep veins (thromboembolism).
- Severe depression.
- Other.

### Possible unwanted side-effects of antibacterial treatment with cefotaxime
- (commonly used to treat Hib-related infections)

#### Common (occurs in more than 1%):
- Colitis, diarrhea, nausea, vomiting.
- Pseudomembranous colitis (inflammation of the colon).
- Rash, pruritus, urticaria, anaphylaxis (severe allergic reaction).
- Injection site inflammation.
- Fever.
- Dizziness.

#### Rare (occurs in less than 1%):
- Low count of leukocytes, thrombocytes, neutrophils (neutropenia, thrombocytopenia, neutropenia).
- Irregular heartbeat (Arrhythmia).
- Headache.
- Encephalopathy (brain dysfunction).
- Vaginitis, moliniasis.
- Intestinal nephritis.
- Toxic epidermal necrolysis.
- Other.

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1 Hib: Haemophilus influenzae type b – a bacteria which can cause serious diseases like meningitis.

Possible complications of the disease and possible side effects of its treatment

**Possible complications of a pneumococcal infection**
*(Streptococcus pneumoniae)*

**EAR INFECTIONS**
- Repeated ear infections requiring ear tubes.

**MENINGITIS**
- Can lead to:
  - Death (1 in 10).
  - Inflammation of the protective coverings of the brain and spinal cord.
  - Hearing loss.
  - Developmental delay.

**PNEUMONIA**
- Can lead to:
  - Death.
  - Collection of pus inside body/thoracic cavity (empyema and abscess).
  - Inflammation near to the heart (pericarditis).
  - Collapse or closure of the lung (atelectasis).
  - Blockage of respiration (endobronchial obstruction).

**SEPSIS**
- Can lead to:
  - Death (4 in 100).
  - A severe blood infection that can lead to organ failure and death.

**SINUS INFECTION**

**Most common unwanted side effects of paracetamol**
*(commonly used to treat a mild case of pneumonia)*

**COMMON**
- Irritation and inflammation inside the nose (rhinitis).
- Severe shortness of breath (dyspnea).
- Coughing, heaviness and tightness in the chest or wheezing (paroxystic bronchial spasm).
- Bleeding from the gastrointestinal tract (gastrointestinal haemorrhage).
- Indigestion or upset stomach (dyspepsia).
- Abdominal pain.
- Ulcer.
- Other.

**IN ADDITION**
- Liver and kidney damage may occur in the case of an overdose.
- Serious complications may occur in combination with other drugs.

**Possible unwanted side effects of basic antibiotics**
*(commonly used to treat a mild case of pneumonia)*

**COMMON**
- Irritation and inflammation inside the nose (rhinitis).
- Severe shortness of breath (dyspnea).
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- Other.

**IN ADDITION**
- Liver and kidney damage may occur in the case of an overdose.
- Serious complications may occur in combination with other drugs.


*If we would compare with the treatment of a more serious case of pneumonia or other diseases caused by Streptococcus pneumoniae, such as meningitis and sepsis, the possible side-effects of the treatment would be even more serious.*

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